Microwave Plasma Monitoring System For Real-Time Elemental Analysis

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There has been invented a process for analyzing ambient air in a microwave induced plasma without use of an additional carrier gas. There has also been invented an apparatus for analyzing ambient air, other sample gas, or nebulized and desolvated liquids wherein a novel arrangement of plasma gas and sample gas conduits is used to enhance dependability of the plasma. This apparatus embodiment of the invention has a concentric arrangement of plasma gas and sample gas conduits so as to provide a sheath of plasma gas both within and surrounding the flow of analyte into the plasma region. The microwave plasma torch can either be contained within a sealed housing or can be operated in ambient air at ambient pressures. The microwave plasma torch of this invention is portable and can be operated continuously for real-time analysis of air. The apparatuses and methods of the present invention can be used wherever there is a need for monitoring air for the presence of minor amounts of elements, particularly transition metals, rare earth elements, actinides, and alkali and alkaline earth elements. The invention apparatus can also be used to monitor for the presence of halogens, sulfur and silicon. The invention apparatuses and methods are more particularly useful for monitoring air for the presence of beryllium.

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